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### **REMARKS/ARGUMENTS**

Responsive to the Final Office Action mailed June 1, 2005, Applicants provide the following remarks. Reconsideration and allowance of the subject application, as amended, are respectfully requested. All objections and rejections are respectfully traversed.

#### **Claim Amendments**

Claims 1, 5, 9 and 10 are presently pending in this case. Claims 4, 6 and 8 have been canceled, without prejudice. Applicants have amended independent claim 1 to incorporate the subject matter of dependent claim 4 to recite "at least one erbium doped fiber amplifier." Similarly, independent claim 9 has been amended to recite "at least one erbium doped fiber amplifier." Claim 9 has also been amended to clarify that amplification is provided to all wavelengths in the range between "about 1560 nm and about 1630 nm." As stated in the present specification on page 2, an erbium doped fiber amplifier (EDFA) amplifies L-band wavelengths while providing a flat gain characteristic and a low noise figure. Page 2, paragraph 20 of U.S. Publication No. 2002-0131131. Moreover, Raman amplification of L-band wavelengths may be used alone or in combination with other amplifiers such as EDFA to achieve a low noise figure. Page 2, paragraphs 20 and 25 of U.S. Publication No. 2002-0131131. No new matter has been added.

#### **35 USC §103 Claim Rejections**

Claims 1, 4 and 9 are rejected under 35 USC §103(a) as being unpatentable over Kakui (US Patent No. 6,549,315) in view of Namiki et al (US Patent No. 6,611,370). Claims 5, 6, 8

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and 10 are rejected under 35 USC §103(a) as being unpatentable over Kakui (US Patent No. 6,549,315) in view of Namiki et al (US Patent No. 6,611,370) and further in view of 765 Gb/s over 2,000 Km transmission using C and L band EDFA, Matthew Ma et al. OFC'99, Postdeadline papers, PD16 (1999), pp1-3.

Kakui, Namiki et al, and Ma article, taken singly or in combination, all fail to disclose or suggest a transmitter configured to transmit a plurality of optical signals over an optical information channel, each of said signals being at an associated "wavelength in a range from about 1560 nm to about 1630 nm", wherein said optical information channel comprises "at least one erbium doped fiber amplifier" and a plurality of "Raman pumps" for amplifying the entire range of wavelengths, as required by independent claims 1 and 9. Kakui discloses an optical transmission system to provide long distance transmission in both of C and L band. Column 2, lines 7 – 10. The system transmits a multiplexed optical signal in two wavelength bands to first and second transmission lines which are connected to each other by way of an amplifying repeater station. Column 2, lines 15 – 20. The amplifying repeater station includes, in relevance, two optical amplifiers, each having an amplification optical waveguide preferably doped with erbium (Er) or Thulium (Tm). Column 2, lines 25 – 30; Column 4, lines 14 – 20. Although Kakui discloses transmission of optical signals in L-band, nowhere does Kakui teach or suggest the desirability of using at least one optical amplifier includes multiple "Raman pumps", as required by independent claims 1 and 9.

The Ma article, similar to Kakui, does not disclose or suggest the use of Raman amplifiers. The Examiner relies on Namiki et al as teaching Raman amplification. Namiki et al, however, specifically teaches away from using an EDFA over the claimed range of "about 1560

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to about 1630 nm” in stating that the “bandwidth of EDFA has a limited range of about 1530 nm to 1610 nm.” Column 1, lines 52 – 56. (emphasis added). Further, the use of EDFA to amplify WDM signals creates a non-uniform amount of gain and thus a flat gain profile cannot be maintained. Column 1, line 60 to Column 2, line 10. Finally, WDM systems using EDFAs are plagued by noise problem. Column 2, lines 10 – 15. Therefore, nowhere does Namiki et al teach or suggest the desirability of using at least one erbium doped fiber amplifier and at least one Raman amplifier for amplifying all wavelengths in a range between “about 1560 to about 1630 nm”, as required by the pending claims.

Of course, to establish a *prima facie* case of obviousness the prior art must teach all of the claimed limitations and must provide a motivation for any combination of teachings from multiple references. Here, the cited references, alone or in combination do not teach “at least one erbium doped fiber amplifier” and multiple Raman pumps” for amplifying all wavelengths in a range from “about 1560 nm to about 1630 nm”, as required by all of the pending claims. Kakui and Ma teach the use of EDFA amplifiers. Figure 2, waveguides 211 and 212; Column 6, lines 26 – 30. Namiki teaches use of Raman amplifiers in a WDM system and teaches away from the use of an EDFA to amplify all signals in the range from about 1560 nm to about 1630 nm.

In teaching away from the using an EDFA to amplify all wavelengths over the cited range, Namiki cannot be considered as suggesting a motivation to combine the teachings of the references or any modification of the teachings. One looking at the teachings of Namiki at the time the claimed invention was made would believe that the “bandwidth of EDFA has a limited range of about 1530 nm to 1610 nm.” Column 1, lines 52 – 56. (emphasis added). Thus, Namiki

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not only fails to teach specific limitations of the pending claims, but also would have led one skilled in the art to avoid use of the claimed invention which requires use of an EDFA to amplify all wavelengths in the range from "about 1560 nm to about 1630 nm."

Applicants respectfully urge that neither Kakui, Ma, nor Namiki et al, taken singly or in combination, teaches or suggests a transmitter configured to transmit a plurality of optical signals over an optical information channel, each of said signals being at an associated "wavelength in a range from about 1560 nm to about 1630 nm", wherein said optical information channel comprises "at least one erbium doped fiber amplifier" and a plurality of "Raman pumps" for amplifying the entire range of wavelengths, as required by independent claims 1 and 9.

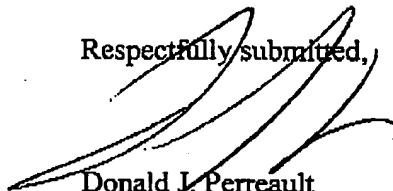
For at least these reasons, Applicants submit that amended independent claims 1 and 9, and claims 5 and 10 which dependent therefrom, are not obvious over Kakui, Namiki and/or Ma. Accordingly, Applicants respectfully urge that the rejections under 35 USC §103 be withdrawn.

The claims have been shown to be allowable over the prior art. Applicants believe that this paper is responsive to each and every ground of rejection cited by the Examiner in the Office Action dated June 1, 2005, and respectfully requests favorable action in this application. In the event the Examiner deems personal contact desirable in disposition of this application, the Examiner is respectfully requested to call the undersigned attorney at (603) 668-6560.

No fees are believed to be due. In the event there are any fee deficiencies, please charge them (or credit any overpayment) to our Deposit Account No. 50-2121

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Respectfully submitted,



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